Space Weather Forecast

Issued on Monday, 27 May 2024 at 13:04 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: A risk of Moderate flares likely throughout, with the return of two previous large sunspots. Mostly quiet to unsettled geomagnetic conditions expected.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity is high with peak flare a strong flare at 27/0708UTC from over the southeastern limb, likely in association with a very active returning region which is expected to rotate onto the visible disc within the next 24 hours. Analysis of the region, once it rotates onto the visible disc, will be necessary to determine if it has retained its full complexity from last rotation. There are eight numbered regions with the most notable being an active region to the northeast. Across the rest of the disc, the regions remain smaller and simpler.

A narrow CME (Coronal Mass Ejection) from the southwest occurred around 27/0150UTC and is currently undergoing ENLIL analysis. However this CME is unlikely to have an Earth-directed component. Additionally, a large and fast CME occurred from over the eastern limb in association with the strong flare this morning, this is awaiting analysis and is not directed towards Earth. Nevertheless, this occurrence does show that this returning region is still likely a very active feature prone to producing fast CMEs.

Solar Wind / Geomagnetic Activity: Background to slightly elevated solar winds speeds were observed, varying between 350-450 km/s. The Interplanetary Magnetic Field (IMF), Bt, was generally weak, with the important north-south component, Bz, also weakly varying. Geomagnetic activity was Quiet (Kp 1-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: High activity is expected, Moderate flares are expected going forward with a chance of isolated strong flares. This risk is predominately from an active returning region which is anticipated to rotate onto the visible disc within the next 24 hours. Additionally, there is a further active region on the disc to the northwest contributing to flare risk.

Solar Wind / Geomagnetic Activity: There is a possibility of weak CME glances at first and potentially later from separate events. However both are considered very unlikely to have significant impact. Weak fast wind influences are also possible, most likely day 1 and into day 2 (27-28 May) from the a coronal hole in the south. Otherwise mainly background slow wind conditions are anticipated.

Mainly Quiet to unsettled geomagnetic activity is expected, perhaps rising to give spells of active conditions at times, but with only a very slight chance of G1 Minor Storm with any coronal hole onset or unlikely CME arrival.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to persist at background

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	5	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	90	90	90	90
Very Active	R3 to R5 X	Yes	40	40	40	40

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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